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SHARP KABUSHIKI KAISHA
C/O KEATING & BENNETT, LLP
1800 Alexander Bell Drive
SUITE 200
Reston, VA 20191

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| EXAMINER |
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CHEN, WEN YING PATTY

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ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

JKEATING@KBIPLAW.COM
uspto@kbiplaw.com
pmedley@kbiplaw.com

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|------------------------------|--------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/549,584 | Applicant(s) UCHIDA, HIDEKI | |
| | Examiner WEN-YING P. CHEN | Art Unit 2871 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 April 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 49-52 and 54-96 is/are pending in the application.
- 4a) Of the above claim(s) 91 and 93-96 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 58-60, 62 and 63 is/are allowed.
- 6) ☒ Claim(s) 49-52, 54-57, 61, 64-73, 75-77, 81-90 and 92 is/are rejected.
- 7) ☒ Claim(s) 74 and 78-80 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

Applicant's amendment filed on 4/15/11 has been entered. Claim 53 has been cancelled, therefore, claims 49-52 and 54-96 remain pending in the current application, however, claims 91 and 93-96 are withdrawn from consideration.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 49-52, 54-57, 61, 64-72, 75-77, 81-90 and 92 are rejected under 35

U.S.C. 102(b) as being anticipated by Johnson et al. (US 2002/0039224).

With respect to claim 49: Johnson discloses in Figure 4 a display system comprising:

a dimming device (Figs. 3A, 3B; the stack formed between elements 11 and 13) capable of switchably presenting a light reflecting state or a light transmitting state (Paragraph 0039); and

a display device for displaying information by modulating light transmitted through the dimming device and/or light reflected by the dimming device (Paragraphs 0001 and 0025);

wherein the dimming device has a plurality of regions (shown in Fig. 5B; wherein each of pixels 101-104 comprises a region of the dimming device) each being independently capable of switchably presenting a light reflecting state or a light transmitting state, and, when a plurality of

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types of information are being displayed on the display device, the dimming device is capable of selectively switching between the light reflecting state or the light transmitting state of each of the plurality of regions in accordance with the types of information being display (Fig. 5B and Paragraph 0025; wherein each of the pixels can be selected to either transmit or reflect either ambient light or light from the backlight device depending on the signal being sent to the electrodes that control the dimming device); and

the dimming device is a dimming device comprising a dimming layer (element 3) whose light reflectance changes in response to an external stimulation (Paragraphs 0017, 0021 and 0033); and the dimming layer contains a first material whose optical characteristics change in accordance with a concentration of a specific element, the first material being particles (Paragraphs 0016-0017; wherein the dimming layer may be formed of LMgHx or GdMgHx, containing of particles of such elements).

As to claim 50: Johnson further discloses in Figure 5B that the display device supplies a display signal to a first display region for performing display by modulating the light transmitted through the dimming device, and supplies a display signal to a second display region for performing display by modulating the light reflected by the dimming device, the display signals being of different types (Paragraphs 0025, 0021; wherein different voltage signals are being sent to change the optical characteristic of the dimming device for either to transmit or reflect light).

As to claim 51: Johnson further discloses in Figure 5B that the display device has a plurality of pixels (elements 101-104); and each of the plurality of regions of the dimming device corresponds to each of the plurality of pixels in a one-to-one relationship (Paragraph 0025).

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As to claim 52: Johnson further discloses in Figures 3A and 3B that the dimming device is a dimming device having a layered structure including a first layer (element 3) and a second layer (elements 5, 7, 9 combined), such that a light reflectance of the first layer changes in response to an external stimulation (Paragraphs 0017, 0021 and 0032-0033);

the first layer contains a first material whose optical characteristics change in accordance with a concentration of a specific element (Paragraphs 0017, 0033); and

the second layer contains a second material capable of containing the specific element, the second material releasing or absorbing the specific element in accordance with the external stimulation (Paragraphs 0018-0019 and 0034).

As to claim 89: Johnson further discloses in Paragraphs 0001-0004 that the display device can be of an LCD display device, thus is inherent to be comprising of a pair of substrates having a liquid crystal layer provided between the pair of substrates.

As to claim 90: Johnson further discloses in Figure 5 an illumination device (element 110), which is of a backlight device, thus would be disposed on an opposite side from a viewer with respect to the display device.

As to claim 92: Johnson further discloses in Figure 4 that the dimming device is formed on top of pixel switching elements (element 22) on a glass substrate (element 1), which would be disposed inside the display device.

With respect to claim 54 (Amended): Johnson discloses in Figure 4 a display system comprising:

a dimming device (Figs. 3A, 3B; the stack formed between elements 11 and 13) capable of switchably presenting a light reflecting state or a light transmitting state (Paragraph 0039); and

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a display device for displaying information by modulating incident light (Paragraph 0001);

the dimming device is a dimming device having a layered structure including a first layer (element 3) and a second layer (elements 5, 7, 9 combined), such that a light reflectance of the first layer changes in response to an external stimulation (Paragraphs 0017, 0021 and 0032-0033);

the first layer contains a first material whose optical characteristics change in accordance with a concentration of a specific element (Paragraphs 0017, 0033), the first material being particles (Paragraphs 0016-0017; wherein the dimming layer may be formed of LMgHx or GdMgHx, containing of particles of such elements); and

the second layer contains a second material capable of containing the specific element, the second material releasing or absorbing the specific element in accordance with the external stimulation (Paragraphs 0018-0019 and 0034).

As to claim 55: Johnson further discloses that the display device performs display by modulating light transmitted through the dimming device and/or light reflected by the dimming device (Paragraphs 0001 and 0025).

As to claim 56: Johnson further discloses in Paragraph 0017 that the element is hydrogen, and the first material is able to transition between a light reflecting state and a light transmitting state in accordance with a hydrogen concentration.

As to claim 57: Johnson further discloses in Paragraph 0019 that the second layer contains a hydrogen storage material.

As to claim 61: Johnson further discloses in Paragraphs 0017-0019 that the second material releases or absorbs the specific element through exchange of electrons.

As to claim 64: Johnson further discloses in Figures 3A and 3B a pair of conductive layers (elements 11 and 13) for forming an electric field for causing ions of the specific element to move from the second material to the first material, or from the first material to the second material (Paragraphs 0016-0021).

As to claim 65: Johnson further discloses in Figures 3A and 3B that the first and second layer (elements 3, 5, 7 and 9) are positioned between the pair of conductive layers (elements 11 and 13).

As to claim 66: Johnson further discloses in Figure 4 that the first layer (element 3) has conductivity, and functions as one of the pair of conductive layers (Paragraph 0017; wherein the switchable layer 3 is made of a metal alloy and in contact with element 11, hence is capable of functioning as a conductive layer).

As to claim 67: Johnson further discloses in Figures 3A and 3B that the second layer has conductivity and functions as one of the pair of conductive layer (Paragraphs 0018-0020; wherein the storage layer 9 is made of a metal alloy and in contact with element 13, hence is capable of functioning as a conductive layer).

As to claim 68: Johnson further discloses that the second layer has a light transmitting ability (Fig. 5 and Paragraph 0021; wherein only element 3 can be switched so as to reflect light, thus all other layers 5, 7 and 9 would be light transmitting).

As to claim 69: Johnson further discloses in Figures 3A and 3B that the second layer (elements 5, 7 and 9 combined) has a multi-layer structure.

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With respect to claim 70: Johnson discloses in Figure 4 a display system comprising:
a dimming device (Figs. 3A, 3B; the stack formed between elements 11 and 13) capable of switchably presenting a light reflecting state or a light transmitting state (Paragraph 0039); and
a display device for performing display by modulating incident light (Paragraph 0001);
wherein,

the dimming device is a dimming device comprising a dimming layer (element 3) whose light reflectance changes in response to an external stimulation (Paragraphs 0017, 0021 and 0033);

the dimming layer contains a first material whose optical characteristics change in accordance with a concentration of a specific element, the first material being particles (Paragraphs 0016-0017; wherein the dimming layer may be formed of LMgHx or GdMgHx, containing of particles of such elements).

As to claim 71: Johnson further discloses that the display device performs display by modulating light transmitted through the dimming device and/or light reflected by the dimming device (Paragraphs 0001 and 0025).

As to claim 72: Johnson further discloses in Paragraphs 0017 and 0033 that the first material is able to transition between a light reflecting state and a light transmitting state in accordance with the concentration of the specific element.

As to claim 75: Johnson further discloses in Paragraph 0017 that the specific element is hydrogen.

As to claim 76: Johnson further discloses in Figures 3A and 3B a conversion layer (elements 5, 7 and 9 combined) containing a second material capable of containing the specific

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element, wherein the second material releases or absorbs the specific element in accordance with the external stimulation (Paragraphs 0017-0021).

As to claim 77: Johnson further discloses in Paragraphs 0017-0019 that the specific element is hydrogen and the conversion layer contains a hydrogen storage material.

As to claim 81: Johnson further discloses in Paragraph 0019 that the second material releases or absorbs the specific element through exchange of electrons.

As to claim 82: Johnson further discloses in Paragraphs 0017-0021 that the second material releases or absorbs the specific element through an electrochemical reaction.

As to claim 83: Johnson further discloses in Figures 3A and 3B a pair of conductive layers (elements 11 and 13) for forming an electric field for causing ions of the specific element to move from the second material to the first material, or from the first material to the second material (Paragraphs 0016-0021).

As to claim 84: Johnson further discloses in Figures 3A and 3B that the dimming layer and the conversion layer (elements 3, 5, 7 and 9) are positioned between the pair of conductive layers (elements 11 and 13).

As to claim 85: Johnson further discloses in Figure 4 that the dimming layer (element 3) has conductivity, and functions as one of the pair of conductive layers (Paragraph 0017; wherein the switchable layer 3 is made of a metal alloy and in contact with element 11, hence is capable of functioning as a conductive layer).

As to claim 86: Johnson further discloses in Figures 3A and 3B that the conversion layer has conductivity and functions as one of the pair of conductive layer (Paragraphs 0018-0020;

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wherein the storage layer 9 is made of a metal alloy and in contact with element 13, hence is capable of functioning as a conductive layer).

As to claim 87: Johnson further discloses that the conversion layer has a light transmitting ability (Fig. 5 and Paragraph 0021; wherein only element 3 can be switched so as to reflect light, thus all other layers 5, 7 and 9 would be light transmitting).

As to claim 88: Johnson further discloses in Figures 3A and 3B that the conversion layer (elements 5, 7 and 9 combined) has a multi-layer structure.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 73 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (US 2002/0039224) in view of Okumura et al. (US 2004/0155999).

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Johnson discloses all of the limitations set forth in the previous claims and further discloses in Paragraph 0033 that the dimming layer (element 3) reflects light when the first material is in the light reflecting state, but Johnson does not disclose that the dimming layer also diffuse light.

However, Okumura teaches in Paragraph 3B of forming a light reflecting layer with an uneven surface so as to diffuse light while reflecting light.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct a display system as taught by Johnson wherein the dimming layer (analogous to the light reflecting layer) is formed to have uneven surface as taught by Okumura, since Okumura teaches that by forming a light reflecting layer with an uneven surface helps to reduce or prevent ambient reflections thus helps to achieve wide-viewing-display (Paragraph 0056).

Allowable Subject Matter

Claims 58-60, 62 and 63 allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 58 (Amended): The closest prior art Johnson discloses all of the limitations set forth in the previous Office Action, but Johnson either alone or in combination does not further teach or suggest that in the region where respective hydrogen equilibrium pressure-composition isotherms (PTC characteristic curves) of the first layer and the second layer are substantially flat.

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Therefore, claim 58 is deemed non-obvious and inventive over the prior arts and is allowed.

As to claims 59 and 60: Since claims 59 and 60 depend either directly or indirectly on the allowed claim 59, thus are also allowed.

Regarding claim 62 (Amended): The closest prior art Johnson discloses all of the limitations set forth in the previous Office Action, but Johnson either alone or in combination does not further teach or suggest that the second material releases or absorbs the specific element in response to light irradiation. Therefore, claim 62 is deemed non-obvious and inventive over the prior arts and is allowed.

As to claim 63: Since claim 63 depends from the allowed claim 62, thus is also allowed.

Claims 74 and 78-80 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 74: The closest prior art Johnson discloses all of the limitations set forth in claim 70 but Johnson either alone or in combination does not further teach or suggest that a diameter of the particles is equal to or greater than 350nm and equal to or less than a thickness of the dimming layer, since Johnson discloses in Paragraph 0017 that the dimming layer has a thickness of only 200nm. Therefore, claim 74 is deemed non-obvious and inventive over the prior arts and is allowable.

Regarding claim 78: The closest prior art Johnson discloses all of the limitations set forth in the previous claims, but Johnson either alone or in combination does not further teach or

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suggest that in the region where respective hydrogen equilibrium pressure-composition isotherms (PTC characteristic curves) of the first layer and the second layer are substantially flat.

Therefore, claims 58 and 78 are deemed non-obvious and inventive over the prior arts and are allowable.

As to claims 79 and 80: Since claims 79 and 80 depend either directly or indirectly on the allowable claim 78, thus are also allowable.

Response to Arguments

Applicant's arguments with respect to independent claim 54 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed on 4/15/11 regarding independent claims 49 and 70 have been fully considered but they are not persuasive.

Applicant argues that Johnson failed to teach or suggest of providing a dimming layer which contains a first material, being made of particles, whose optical characteristics change in accordance with a concentration of a specific element. However, Johnson specifically discloses in Figure 4 a dimming layer (element 3) which contains a first material, being made of particles (Paragraphs 0016-0017; wherein the dimming layer may be formed of LMgHx or GdMgHx, containing of particles of such elements), whose optical characteristics change in accordance with a concentration of a specific element (Paragraphs 0016-0017, 0021, 0032-0033; wherein the reflectance of the dimming layer is controlled by the concentration of hydrogen). Therefore, Johnson is believe to have disclosed the recited limitations, hence, the argument is not found persuasive and the rejections are maintained.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WEN-YING P. CHEN whose telephone number is (571)272-8444. The examiner can normally be reached on 8:00-5:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on (571)272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

WEN-YING P CHEN
Primary Examiner
Art Unit 2871

/WEN-YING P CHEN/
Primary Examiner, Art Unit 2871